



SAN BERNARDINO MICROWAVE SOCIETY, Incorporated

FORMED IN 1969

A NONPROFIT AMATEUR TECHNICAL ORGANIZATION DEDICATED
TO THE ADVANCEMENT OF COMMUNICATIONS ALONE 1969 INC.

W6IFE Newsletter

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The **2 August 2001** meeting of the SBMS will be a planning and work session for the upcoming 10 GHz and Up contest. The SBMS meets at the American Legion Hall 1024 Main Street (south of the 91 freeway) in Corona, CA at 1900 hours local time on the first Thursday of each month. Check out the SBMS web site at <http://www.ham-radio.com/sbms/>.

Last meeting Dick Kolbly, K6HIJ talked about his experiences constructing a 24 GHz waveguide switch. Drawings of his switch are in this edition of the newsletter. Dick says the switch is simple in concept but tolerances are the key to making it work. With 0.002-inch clearances there are leakage and resonance's to deal with. A number of fixtures had to be built to machine the individual parts for the switch. Making the rotator with 90-degree rotational positions was a big problem. The first compete switch had 40 dB isolation and 21 dB return loss as measured by Chuck, WA6EXV. Dick wants more in the way of 60 dB isolation and will be trying different chocks and tolerance improvements. Dick plans to build a power measurement test bench so he can try different machining techniques without the turn around time of sending the device off to Chuck for measurement. Super Project and report Dick. Dick's handouts are included here. Thanks.

Dick, K6HIJ reported visiting the Antique Radio Museum in Bellingham Washington, which has various aspects of radio history displayed. The museum owner eventually hopes to have a test bench from the early 1900's time period for the repair of radios from that time period. Amateur radio is also part of the display. Dick proposed that the society assemble a group of items and documentation for an Amateur microwave display in the museum. Dick is to write up a proposal for membership agreement next month. The plan is to have folks with the desired pieces of historic hardware and documentation adds to the collection to be sent. The membership voted to supply \$50 for the reproduction of photographs. Suggested committee members would be K6HIJ, K6JEY, K6MBL, WA6QYR and others. Chip, N6CA announced that the Western States Weak Signal Society was looking for microwave articles to be published in the proceedings for the September convention in Ventura. Articles needed to be received by mid August for inclusion. There was lots of discussion about the upcoming 10 GHz and Up cumulative contest. Chuck, WA6EXV plans to be on Cory Pk in September for some long 24 GHz narrow band shots. Welcome to visitors Doug Cabell, KA6CAT of Huntington Beach and to Dale Cabell, N6AQQ of Santa Ana. 21 people present on a hot humid July meeting.

The Prez Sez. While you are musing over your microwave rig and getting it ready for the contest, remember to put a telegraph key on it. More precisely, put a device on your radio that you can send code with that is unobtrusive, hard to leave behind and won't be harmed by handling the rig and dish. You would

be surprised at how your code comes back to you when you are struggling with your best DX QSO. However, if you don't have the connector, some wire and something to send with, it is very hard to send code. (A show of hands please, for those who have done a whole QSO with the PTT switch or TR switch).

In my case the poorest choice was a J-38. It was fine on the desk, but ended up in the box about the time I needed it and was hard to send with. So, instead of thinking about a key, I began to think about a device that would accomplish the same thing. Some choices might be: a micro switch with a flow sensor leaf on it, a relay that you can hand actuate, or a tiny finger key. Be sure to put it in a place that won't throw the dish off its pointing when you send. You could, but you would end up sending a kind of weird code. Check out some of the web pages for keys that feature QRP rigs such as: <http://www.frontiernet.net/~embres/qrp-lionks.htm>. Good luck with your rigs and see you at the get ready session in July as well as on the air during the contest. Doug Millar

Activity reported at the 5 July SBMS meeting; Doug, K6JEY had some 10 GHz contacts during the June contest; Mel, WA6JBD finished his conversion of an original MA/COM 10 GHz rig and it is to have a 1 dB LNA and a 2 w amplifier, he also did some testing of surplus commercial 6 GHz TWTs; Ken, WB6DTA was in DM22 for June with lots of 6 mtr contacts; John, KJ6HZ built a 2 GHz Helix antenna and did some 10 GHz work; Kurt, K6RRA had some 10 GHz coaxial cable problems during June contest but did manage to contact N6CA in Mexico; Visitor Dale, N6AQQ did some 10 GHz gunnplexer work in the 80's; Visitor Doug, KA6CAT has been doing 800 MHz work; Dave, WA6CGR had contacts with the Mexico crew during the June contest and did some 10 GHz contacts during Field Day; Chip, N6CA related some of his experiences in Mexico which had some 38 microwave contacts during the June contest at ranges from 200 miles to 400 miles. Contacts with WA6MEM airmobile on 10 GHz. Lots of rovers out now with 900, 1200 and 2300 MHz gear. Again weather made contacts interesting in that low altitudes seemed to be better along the coast. Dick, K6HIJ visited Washington State and did his experiments with the waveguide switch; Chris, N9RIN did some 10 GHz transverter work; Bob, W6SYA was out in June with lots of contacts and WB6DTA and W6TSK came over and helped rearrange antennas on his tower so he has 1296 and 2304 MHz on the air now; Gary, W6KVC did some ATV work; Chuck, N6EQ was out in June with the WA6CGR group in Diamond Bar and made contacts into Mexico; Frank, WB6CWN was out in June without liaison radio and was happy to find many contacts just like on HF by calling CQ; Robin, WA6CDR worked on the antennas of Frazier beacon while the tower is to be raised. The Beacon is to be back on the air for the contest one way or another. Dick, WB6DNX was on with the Diamond Bar group in June and has straightened out a dish bent by the wind; Jeff, KN6VR did some 1296 MHz work; Chuck, WA6EXV is rebuilding his 24 GHz narrowband RF deck, was on field Day with 10 and 24 GHz to WA6QYR, and is packaging the 1.2/2.4 GHz Heaps Peak translator using K6VLM translator and WA6EXV power amplifiers; Bill, WA6QYR responded to a San Bernardino Sun Newspaper reporter as did several other members for an article about amateur radio, participated in the Ridgecrest ham club Field day with 10 and 24 GHz radios; and the oscillator controlled by the GPS is settling in much better now. Dick, K6HIJ has contacted the San Bernardino

Sun reporter Greg Patton about the article on the Society and will have it prepared for Chip to put on the web page.

Badges- the following badges are available from Dick, K6HIJ&emdash;AC6RM, Martin; AD6QL Carl; AL7EB Ed; K0BGL, Dale; K6ENS, Charles; KC6TFS, John; KE6BAA, Ed; KE6RCI, Eric; KF6HQC, Fred; KN6VR, Jeff; N2LIV, Bruce; N6DN, Paul, N6LL, Paul; NN6W, Gary; W6KL, Dave; W6ORG, Tom; W6ZKZ, Vince; W7CS, Chuck; W9DHK, Peter; WA5DJJ, Dave; WA6WAK, Charles; WA6YOJ, Gene; WD4MUO, John; WQ6S, Steve.

Scheduling

4 August UHF Contest

18-19 August ARRL 10 GHz and Up Cumulative contest 1st half

6 September Program TBD

8 September ARRL September VHF Contest

15-16 September ARRL 10 GHz and Up Cumulative contest 2nd half

Wants and Gots for Sale

For Sale: Un-modified MA/COM units; 10 mtr HTS 100; 2-mtr DEM transverter, MA/COM dish, tripod Ed K6ODV 909-689-1339

Want info from anyone who knows how to compute power factor from arbitrary waveforms- dick K6HIJ 760-253-2477

Want sensor head for thermistor head for HP 432 Mel, WA6JBD 909-369-6515.

Want service manual for Systron Donner 1502 Signal Generator Sam K6VLM.

Want HP 1 MHz/ 10 MHz 101A manual or circuit, Dick WB6DNX 714-529-2800.

Hi Bill, Your SBMS July Newsletter reminded me to upload the DX Site List to the SBMS Web Pages, San Diego Technical papers section. As suggested by K6HIJ I have added elevation data to the sites when available. The list is in Adobe (.pdf) format so users will need an Adobe Acrobat Reader program to download and recover it. 73s from Ed, W6OYJ (858) 453-4563

Hi Bill, More activity on 24 GHz. On 28 June 2001, we set a Colorado record for 24 GHz. Don, N0UGY went to Pikes Pk. DM78LU. The first contact was to my home QTH DN70LT. This is a distance of 135 miles. Signals were S9. I then traveled to DN70OX on Rt 85 near the Colorado/Wyoming border. Signals were also S9. This is a distance of 147 miles. I was accompanied by Phil, AA0BR, who also made the contacts. Don is running 1 watt to a 12 in. dish. I am running 60 mw to a 24 in Macom dish. Phil also runs 60 mw and uses a 20 in dish. We used 10 GHz to establish pointing. Don has a dual band feed and I can put my 30 in x-band dish on the same mount as the 24 GHz dish. 73, Phil, W6HCC

Hola, go to: <http://www.ham-radio.com/wa6mem/> for the pictures and story of Gary's aeronautical mobile X-band operations in the June contest. 73 Chip N6CA

Hello Microwavers, Using a search engine I accidentally discovered web pages by Brian Yee that describe some of the 21-23 GHz LO Bricks made by DMC, that can be useful in building a 24 GHz xvrtr. The URL is: http://reality.sgi.com/byee_mti/dmc.html. Info includes color-coding of wire leads, voltages, and frequency ranges versus model numbers of some of the bricks. 73s from Ed, W6OYJ (858) 453-4563

Here is the simplest 432 MHz IF t/r switch. None! I have used this on my latest 24 GHz rig and it works fine. This scheme will not work on 144 MHz. Too much reverse loss. Start with a bias tap to extract the +12 volts which ICOM radios provide at their antenna output terminal. This is present during receive and goes to OPEN circuit during transmit. This voltage is used as a logic signal to control T/R functions in the transceiver. Next is a 20 dB power attenuator from the IF radio to the transverter. I am assuming 5 watts or less out of the radio. This reduces the power from 5 watts to 50 mill watts. (+37 dBm &endash; 20 dB=+17 dBm). Next in the line is an IF preamp using a Mini-Circuits MAR-8. This amplifier is rated for 100 mill watts at the input or output with no damage. At 432 MHz it typically provides 26 dB gain. The MAR-8 is between the power attenuator and the microwave mixer. Its 26 dB forward gain provides 6 dB net gain with the 20 dB power attenuator. (The noise figure of the ICOM 820 is degraded by about 1 dB.) The reverse loss of the MAR-8 is &endash;27 dB. This reduces the +17 dBm from the attenuator to &endash;10 dBm at the mixer. NO Switching! Power is left on the MAR-8 for both transmit and receive. Reverse linearity is good and no distortion is noted on the transmit signal.

Transmit +37 dBm +17 dBm -10 dBm to mixer

Receive 6 dB net gain -20 dB 26 dB gain

IF Radio bias tap power attenuator MAR-8 IF post amp Microwave mixer

(ICOM 820) 12 v 20 dB post-amp +26/-27 dB RX/TX

Control Hope this is useful. 73's Phil W6HCC/0



Here is founder Tommy, W6IFE and Don, W6RNA with their 1950's microwave rigs in Don's back yard. Photo from K6MBL files. The San Bernardino Microwave Society is a technical amateur radio club affiliated with the ARRL having a membership of over 90 amateurs from Hawaii and Alaska to the east coast. Dues are \$15 per year which includes a badge and monthly newsletter. Your mail label indicates your call followed by when your dues are due. Dues can be sent to the treasurer as listed under the banner on the front page. If you have material you would like in the newsletter please send it to Bill WA6QYR at 247 Rebel Road Ridgecrest, CA 93555, bburns@ridgecrest.ca.us, or phone 760-375-8566. The newsletter is generated about the 15th of the month and put into the mail at least the week prior to the meeting. This is your newsletter. SBMS Newsletter material can be copied as long as SBMS is identified as source.

San Bernardino Microwave Society newsletter

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73's Bill